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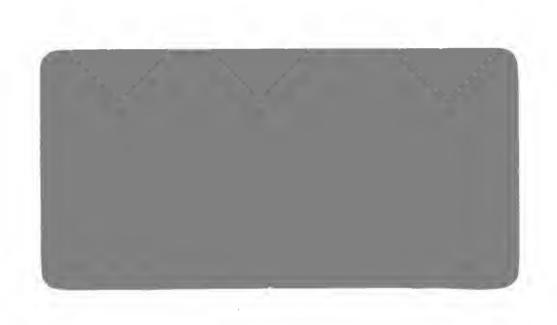
EXPERIENCE AND COALITION BEHAVIOR: THE
QUESTION OF GENERALIZABILITY

J. Keith Murnighan, Assistant Professor,
 Department of Business Administration

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Summary:

This study investigated the effects of experience on several outcomes of coalition bargaining. Students with no experience in bargaining, students with experience in bargaining, and executives from industry participated in a five-person "Apex" coalition game.   In this game one player could form a winning coalition with any other single player, and could be excluded from the winning coalition only if the other four players coalesced. Results replicated prior findings on Apex games, and indicated only minimal differences between the different subject populations. The impact of these findings on the question of the generalizability of coalition results is discussed.

Experience and Coalition Behavior:

The Question of Generalizability

Research on coalition behavior has been appearing with increasing
frequency in the recent literature (e.g., Komorita and Brinberg, 1977;
Murnighan and Roth, 1977; 1978; etc.). One characteristic that is common
to almost all coalition studies is their sample of subjects, undergraduate
students. The often stated criticism that studies in behavioral science
are limited in their generality to undergraduate (primarily psychology)
students can also be addressed to studies in coalition behavior. Thus,
the current study was designed to compare the coalition bargaining behavior
of subject populations who differed in their knowledge and experience in
"real world" bargaining, including: (1) A group of students unfamiliar
with coalition bargaining; (2) A group of students with experience in
coalition bargaining; And (3) a group of executives, enrolled in a special
masters-level program, with little experience in experimental coalition
bargaining but, presumably, considerable experience in "real world" bargaining.

Viewing all interpersonal interactions as exchanges (e.g., Gergen,
1969) might suggest that all interpersonal interactions could also be
viewed as bargaining interactions. As Rubin and Brown (1975) point out,
however, this definition is so broad as to be effectively meaningless.
They refined this definition, and, for the present purposes, the elements
that are important in identifying an interaction as one that can be more
specifically identified as bargaining are (1) conflict of interest and
(2) the exchange of demands and proposals. Thus, when boy meets girl
and romance ensues, we might not define the situation as bargaining. When
labor meets management, and discussions ensue concerning a new contract,

bargaining is easily recognizable. When the concern is coalition bargaining rather than dyadic bargaining, fewer situations are easily identifiable. Large-scale international and interorganizational negotiations may offer the best examples.

Given fewer coalition bargaining situations in the world, one might expect fewer coalition bargainers: Husbands and wives, car salesmen and their customers, merchants and consumers all engage in dyadic bargaining but only rarely do they engage in coalition bargaining. The increased complexity inherent in coalition bargaining restricts the population of interest almost by definition. Thus, one might expect to find studies of coalition behavior that include intelligent, experienced subjects. Unfortunately, as we have noted, this is unusual: most experimental subjects have had little or no bargaining experience.

This study investigates two aspects of experience: One is experience with coalition bargaining games such as those studied in this experiment. The processes involved in coalition bargaining can be assumed to change as one becomes familiar with the contingencies inherent in complex coalition games. Finding oneself being excluded from the winning coalition, for instance, might result in more rapid, extreme, or effective attempts to alter the potential outcome when one is an experienced bargainer. Experience should give a bargainer an advantage, and if all players are experienced, the bargaining process should change. The other aspect of experience studied here, what might be called general business experience, might also give a bargainer an advantage. Merely "having been around" might prepare one better for the contingencies that might arise in a bargaining encounter. Both of these aspects of experience were studied in this experiment.

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The setting for this research (i.e., the game studied) established one strong position and four relatively weak positions in a five-person, "Apex" game. Apex games, originally named by Horowitz and Rapoport (1974), are structured so that the strong, Apex player can form a coalition with any one of the other players and can only be excluded by a coalition that includes all of the other players. Thus, it establishes a mixed-motive situation that is particularly taxing to the non-Apex players, who have the choice of competing with one another to try and form a coalition with the Apex player or cooperating with one another to try and form a coalition among themselves, thus excluding the Apex player. Various forms of this game have been studied by Chertkoff (1971), Komorita and Meek (1973; 1978), Michener, Fleishman, and Vaske (1976), Murnighan, Komorita, and Szwajkowski (1977), and Willis (1962). The typical result is that coalitions including the Apex form significantly more often than the coalition of all the non-Apex players (Murnighan, 1978a). In addition to its frequent use in research with undergraduates, the game mirrors the fairly prevalent "real world" situation where a leader (i.e., the Apex player) will be able to dominate if only minimal subordinate assistance surfaces, but will not be able to proceed effectively in the face of unified resistance.

METHOD

Subjects. There were 160 subjects in the experiment. Thirty were advanced undergraduates and graduate students enrolled in a behavioral science course in a commerce department. None of these subjects (hereafter called non-experienced) had previously participated in coalition games, but each was given a lengthy introduction to the procedures to

be used in the experiment (see below). Ninety (hereafter called "experienced") were also students, at the same level in school and enrolled in the same course, who had played at least one coalition game (not an Apex game) previously. This set of 120 subjects constituted the subjects for a previous study that focused on theoretical tests of four coalition models (Murnighan, 1978b). The fact that one of the games they played was the same Apex game as the one played by the remaining forty subjects made this study possible. This last group of forty subjects (hereafter called "executive") were enrolled in an Executive Masters in Business Administration program. Each had been out of school at least ten years and held a managerial position with considerable authority. Most had completed an undergraduate degree; several had completed graduate and doctoral degrees. Their positions and experiences varied widely, including dentists, attorneys, real estate developers, bankers, engineers, pharmacists, insurance executives, plant managers, etc.

Procedure. The participants were given general instructions about the coalition games in the class prior to the beginning of the experiment. Several examples of the use of the procedure (in games not used later) were discussed. The players were told that there would be 12 trials in the game, and on each trial, the winning coalition would divide a prize of 100 points among its members. They were instructed to do as well as they could (i.e., maximize their points). For the non-executives, their performance determined part of their course grade.[1]

Students were randomly assigned to groups. Each group played the game for a total of 10 or 12 trials, where a trial was defined as the

formation of a winning coalition. For each game, player positions were designated A, B, C, D, and E, with player A having the most resources, player B having the second most resources, etc.

During the games, the players were seated around a set of opaque partitions that shielded them from view of each other and the experimenter. At each group's first session, or in the class prior to this session, the experimenter read specific instructions about the procedures for the games. The players made offers on each trial by means of written "offer slips," which required indicating to whom one wished to send his/her offers and also a proposal regarding the division of rewards for the prospective coalition members. For example, if player X wished to form an XY coalition, he/she addressed an offer to player Y and specified a division of the rewards (e.g., 60 for X and 40 for Y) on the offer slip. A player was required to send an offer slip to each player included in the proposed coalition. Thus, if a player proposed a four person coalition, three offer slips were sent, one to each of the proposed coalition partners. Players were also told that the three offer slips must be identical with regard to the proposed division of rewards; for example, a player could not send an offer to one person to form one coalition and a second different offer to another person to form another coalition. This procedure, originally used by Komorita and Meek (1973), allowed two-, three-, and four-person coalitions to form in a single step. Thus, although large coalitions may be more difficult to form, the difficulty was not inherent in this procedure. After the players had completed the offers, the experimenter collected, examined, and distributed them to the proper persons.

After receiving an offer, each person could accept or reject it by marking "Accept" or "Reject" at the bottom of each offer slip. A person receiving more than one offer could accept at most one offer, unless the offers proposed the identical payoff division for the same coalition. Hence, each person could only accept offers to form a single coalition on each trial. Furthermore, in determining the winning coalition, any player's proposal, if accepted, had priority over any offer he might accept, thus committing him to his or her own offer. After the offers had been accepted or rejected, the experimenter collected the offer slips and announced the winning coalition, if one had formed. A coalition was declared winning if all the proposed coalition partners accepted the offer. If no coalition formed because at least one person rejected each of the proposed coalitions, the procedure was repeated until one had formed successfully. This procedure allowed for acceptance within the group of two or three proposals on the same trial. For instance, if A sent an offer to C, D sent an offer to A, and both offers were accepted, AC would be declared the winning coalition because A was committed to his/her offer (invalidating his/her acceptance). While the offer D sent to A did not result in a coalition, it indicated the exact nature (i.e., how much he/she was willing to offer) of D's interest. If three coalitions formed in this manner, with each being invalidatd by another, the players were informed of the situation and the trial was rerun.

A practice trial was conducted before the start of the first session. Immediately after the practice trial, the players were assigned to their positions for that game. Lists of the resources (i.e., votes) for each position and the winning coalitions were also provided. No verbal com-

munication was permitted thereafter; hence, the players could not identify each others' positions once the session had begun.

Some changes were necessary in the procedures used with the executives because their restricted schedules forced all of them to play the game in one of two separate sessions, with twenty subjects in each session. Instead of being seated behind partitions, executives were seated one behind another in a row of five people. There were two rows in each of two class rooms. Offers, acceptances, and rejections were collected by an experimenter who walked up and down the aisle next to each row of participants. Because of the presence of two groups in a single room, agreements were not announced verbally, but were displayed on posters that could be seen only by the appropriate group. Thus, each group member was informed about each of the agreements, and was not informed about the agreements reached by the other group that met in the same room. Also due to time constraints, four of the eight executive groups were given revised last-trial information during their session. At approximately the sixth trial, these four groups were informed that they would only continue for 10 trials, and that their tenth trial would be the last one for their group. Thus, four of the executive groups completed 10 trials and four completed 12.

Design. Thirty of the non-executives (the six non-experienced groups) and the 40 executives played the Apex game without having been exposed to other coalition games. The remaining 90 non-executives (the 18 experienced groups) had played one, two, or three different coalition games prior to playing the Apex game. These three sets of groups comprised the experience factor.

As mentioned, the groups played either 10 or 12 trials. To make these different sequences comparable, the average payoffs, demands, and number of offers of the players were calculated for each of four trial blocks. For the 12 trial sessions, each block consisted of three trials. For the 10 trial sessions, the first and last blocks included two trials; the second and third included three trials. Thus, trial blocks was a repeated factor with four levels.

The third factor was the position the players were assigned to (i.e., A, B, C, D, or E). As the Apex and non-Apex players were not particularly comparable, they were not included in the same analyses. Instead separate analyses were conducted for the Apex players and for the non-Apex players, where the non-Apex analyses had an additional four level, between subjects factor, the positions of the players (B, C, D, or E).

RESULTS

The frequencies of the different minimum winning coalitions (i.e., coalitions that will no longer be winning with the absence of any member) for the different experience conditions are shown in Table 1. In all three conditions, each of the two person coalitions occurred more frequently than the four-person, non-Apex coalition (BCDE). There is some disparity among the groups when the frequencies of the four two-player coalitions are compared. In the non-experienced groups, the AB coalition was relatively more frequent than in the other conditions; in the executive groups, the AE coalition was relatively more frequent. Both of these disparities were apparently due to the formation of relatively stable coalitions in three of the fourteen groups in these two conditions--one

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in the non-experienced groups and two in the executive groups. These
stable coalitions continued to form for several consecutive trials, in-
creasing the overall frequencies of the AB and AE coalitions in the
respective conditions. Overall, the BCDE coalition was less frequent
than any of the Apex coalitions, for each condition. This finding
replicates previous research on Apex games, which has uniformly found
a low incidence of non-Apex coalitions.

The payoffs the Apex players received when they were included in
the winning coalition, their demands, the number of offers they received,
and the overall payoffs they received, are displayed in Table 2. Each of
the first three variables were analyzed in an experience by trial blocks
analysis of variance, with experience a between factor and trial blocks
a within, repeated factor. Overall payoffs were analyzed in a one-way
analysis of variance over experience conditions. No interactions between
experience and trial blocks and only one main effect, for the Apex
players' demands, resulted. Although Table 2 indicates some variation
in the payoffs Apex players received, the payoffs received by the execu-
tives fell between those received by the two student groups, the non-
experienced and and experienced.

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These results also parallel those found in previous research and
support the predictions of the two models most frequently supported,
bargaining theory (Komorita and Chertkoff, 1973) and the weighted prob-

ability model (Komorita, 1974). The Apex players' payoffs when included in the winning coalition are quite close to the 75-25 predictions of the weighted probability model, and the predictions of bargaining theory, which range from 73 to 80, depending on the coalition partner. Thus, as with the findings for coalition frequencies, these data replicate previous research, over all three experience conditions.

The results for the Apex players' demands do suggest that the different subject populations may respond to the game in different ways. The executive groups demanded significantly less, on average, than the non-experienced student groups. (Post hoc tests, however, using the Newman-Keuls procedure, resulted in no differences between the experienced students and the other two groups at the .05 level of significance.) Again, these results might be due to the relatively small sample size. Among the eight executive Apex players, two demanded relatively little; the remaining six made demands much like those of the six non-experienced student Apex players. This difference, then, can be attributed to the behavior of two players. Further research is warranted to see if this difference can be replicated.

A final analysis was conducted on the payoffs, demands, overall payoffs, and the number of offers received by the non-Apex players. The anova considered three factors: Experience, trial blocks, and player position (B, C, D, or E). No main effects or interactions were found for any of the variables for experience.

Discussion

The major focus of this paper has been a comparison of the behavior of three sets of individuals in a coalition bargaining game. The data

reveal no important differences among the groups as far as the outcomes of bargaining are concerned. The coalitions that formed and the payoffs which members of these coalitions received were very similar in each of the three groups. One process variable, the Apex players' demands, showed a difference among the groups, indicating that executive Apex players, on average, demanded less than the non-executives. However, even this difference did not affect the final outcomes, and seems to be attributable to the behavior of only two individuals. Thus, the findings negate the typical argument that the results of coalition research apply only to undergraduate students.

The data also tended to replicate earlier studies on Apex games. Apex players were only infrequently excluded from the winning coalition, and obtained a large majority of the payoffs when they were included. Thus, not only are the different groups in this study similar to one another on the basis of their coalition outcomes, but they are also similar to previous samples. This should further contribute to confidence in the generalizability of the results.

In addition, the fact that this study varied some of the procedures used for the different groups warrants discussion. Because of time constraints, the experimental procedures for the executives did not conform exactly to those used for the non-executives. While this suggests that changes in the procedures may have established effects that were cancelled by the changes in the subject populations, this possibility seems remote. Instead, as Campbell and Stanley (1963) have noted, minor variations in experimental procedures combined with similar results across conditions increases confidence in the validity of the findings.

In this case, then, confidence in the effect that this particular game structure has on the outcomes of coalition bargaining (i.e., that the non-Apex coalitions are relatively infrequent and that the Apex player garners a substantial majority of the payoffs) is strengthened.

In summary, this study expands the boundaries of coalition research to different subject populations. Further research on the generalizability of coalition bargaining, investigating different procedures (Komorita and Meek, 1978), different manipulations of independent variables, and particularly different research settings (i.e., the field instead of the laboratory) would be extremely worthwhile.

MURNIGHAN, J. K. (1978a) "Models of coalition behavior: Game theoretic, social psychological, and political perspectives." Psychological Bulletin 85: 1130-1153.

MURNIGHAN, J. K. (1978b) "Strength and weakness in four coalition situations." Behavioral Science 23: 195-208.

MURNIGHAN, J. K., S. S. KOMORITA, and E. SZWAJKOWSKI (1977) "Theories of coalition formation and the effects of reference groups." Journal of Experimental and Social Psychology 13: 166-181.

MURNIGHAN, J. K. and A. E. ROTH (1977) "The effects of communication and information availability in an experimental study of a three-person game." Management Science 23: 1336-1348.

MURNIGHAN, J. K. and A. E. ROTH (1978) "Large group bargaining in a characteristic function game." Journal of Conflict Resolution 22: 299-317.

RUBIN, J. Z. and B. R. BROWN (1975) The Social Psychology of Bargaining and Negotiation. New York: Academic Press.

WILLIS, R. H. (1962) "Coalitions in the tetrad." Sociometry 25: 358-376.

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FOOTNOTE

1. Elaborate procedures were instituted to insure that grading of the outcomes of the experiment were fair, especially given the inter-dependence of outcomes, and that students were not coerced into participating. A write-up of these procedures is available from the author on request.

Table 1

The Frequency of Coalitions in the Experience Conditions

Condition	AB	AC	AD	AE	BCDE	
Non-Experienced	25	14	11	14	7	71[a]
Experienced	40	47	42	56	31	216
Executive	16	12	11	40	8	87[b]
	81	73	64	110	46	

[a] An ABC coalition was not included.

[b] An ACD coalition was not included.

Table 2

Means of the Dependent Variables for the Experience Conditions

	Non-Experienced	Experienced	Executives	F^{a}	$p<$
Apex Payoffs When Included	80.0	70.8	73.1	1.21	ns
Apex Demands	77.0	73.7	63.3	3.53	.05
Apex Payoffs Overall (Including All Trials)	74.3	65.0	69.4	<1	ns
Number of Offers to Apex Player	2.43	2.53	2.64	<1	ns

[a]Degrees of freedom are (2,29) for each test.